NOTES TO ARCHITECT

SECTION 02444 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

The State Div. of P.W. Design Branch's "Chain Link Fence Details" sheet shall be used or copied for use with this section.

1.01 GENERAL CONDITIONS

As specified in Section 00700.

1.02 GENERAL REQUIREMENTS

Furnish materials, labor and equipment necessary to install all chain link fences and gates to the limits shown and as detailed on the plan and as specified herein.

These specifications are not intended for use in locales subject to severe salt air exposure (such as the North Shore of Oahu). Modify your specs accordingly for facilities in those type areas.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Asbestos Prohibition: No asbestos containing materials shall be used under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free unless specifically approved in writing by the Engineer.

B. Chain Link Fence Fabric shall be 2-inch mesh unless otherwise shown or specified, be galvanized and conform to ASTM A392, Class 1. The hot-dipped galvanized fabric shall contain not less than 1.2 ounces per sq. ft. of uncoated wire surface as determined by stripping test ASTM A90 and under the PREECE Test (ASTM A239), shall withstand 6 or more 1-minute dips before reaching the end point. All fabric shall be free from barbs, icicles or other hazardous projections resulting from galvanizing. Aluminum clad fabric shall be an acceptable alternate to the hot-dipped galvanized fabric provided it is of the same gauge as the latter.

Change mesh size to 1-3/4" for tennis courts.

Include all fabrics listed in the Hawaii Products List which meet these specifications in your project specs.

C. Tie Wire shall be 12-gauge (9 gauge for gates) soft annealed galvanized steel wire as called for on plans.

D. Tension Bar shall be **3/16**" thick by 3/4" wide mild steel bar for attachment of a fabric to a terminal post.

Specify 1/4" thick bars for prison projects.

E. Brace Band shall be formed from steel bands at least 1/8" thick by 3/4" wide.

F. Tension Band shall be formed from steel bands at least 12 gauge thick by 3/4" wide.

NOTES TO ARCHITECT

G. Tension Rod shall be a 3/8" dia. mild steel rod threaded at one end and hooked 180 degrees at the other.

H. Fittings:

1. Post Cap and Eye Top shall be of one-piece cast iron construction and shall attach securely onto their respective posts.

2. Coupling for top rails shall be outside sleeve type, at least 6 inches long and crimped at center.

3. Rail Ends shall be snug, one-piece fittings for top and brace rails with holes to receive 5/16" bolts for securing to rail end bands.

4. Double Rail End shall be similar to rail and except for an additional 1/2" hole to receive the hooked end of a tension rod.

H. Composition and Finish of Metal Parts: All metal parts and fittings, including tracks, gate hardware and frames, shall be of steel, malleable iron or wrought iron and shall be galvanized by the hot-dip process, after fabrication, in conformance with ASTM A153. The coating on all parts shall be continuous and smooth; that is, free from barbs, icicles or other projections. Bolts may be cadmium-plated in conformance with ASTM A165 instead.

I. Gate Hardware:

1. Hinges shall be heavy duty offset type permitting 180-degree swing using double clamping method of attachment and manufactured or forged malleable iron. All hinges shall be of appropriate size and capacity for the particular gate being supported and/or operated.

2. Unless otherwise shown or specified, padlocking provisions for walk gate shall be a fork latch assembly, and that for a drive gate shall be an industrial drop rod guide and latch assembly as detailed in the plans.

3. Padlock shall be 5-pin cylinder type with brass case and a 5/16" dia. hardened steel shackle. Padlocks shall be keyed differently but masterkeyed to the fence system. Two (2) masterkeys shall be provided.

Specify requirement for chain if needed.

J. Posts, Rails and Braces shall be of either standard weight, hot-dipped galvanized, welded and seamless steel pipes conforming to ASTM A120 or hot-dipped galvanized pipes with chromate conversion and polyurethane coatings ("Tuf 40" by American Tube Co., Inc. or approved equal). Posts of the latter type of pipes shall be shall be sized in accordance with and have the minimum properties shown in the table below. Additionally, Tuf 40 type pipes shall not be used where welded pipe frames are called for.

Dimensions and Weights of Tuf 40 Steel Pipe Posts

Post Type/Fence Ht. (*/ft.)	Nom.Dim. (in.)	O.D. (in.)	I.D. (in.)	Weight (lbs/ft)
Rails only	1-5/8	1.660	1.440	1.82
L/4	1-7/8	1.900	1.660	2.28
L/6-8; T/4	2-3/8	2.375	2.115	3.12
L/10,12; T/6-8	2-7/8	2.875	2.555	4.64

*L - Line posts; T - Terminal posts

K. Tension Wire shall be of 7-gauge coiled spring or 6-gauge plain galvanized wire.

L. Concrete for post footings shall be Class 2500 as specified in Section 03300.

PART 3 - EXECUTION

3.01 INSTALLATION AND WORKMANSHIP

A. General:

1. Metal fencing and gates of the various types called for shall be erected in strict conformance with the plans and these specifications. The gates and hardware shall provide intended freedom of operation. Posts shall be plumb and in line. Welding shall be done in accordance with latest AWS standards. However, no splicing of posts, rails or braces shall be accepted. Where changes in line occur with an angle of deflection of 30 degrees or more, the change point will be considered a corner and a corner post shall be installed thereat. End, corner, and gate posts for fences with 5-foot and wider fabric shall be braced to the nearest line post with horizontal braces and tension rods. The

horizontal braces shall be spaced midway between top rail and ground and securely fastened to posts as shown on plans. Where fencing is placed along a curve with radius of 50 feet, or less, horizontal braces (and tension rods) shall be installed between all posts in like manner. Pull posts, at maximum intervals of 300 feet, shall be braced and trusses in both directions as specified above.

2. Field Touch-Ups: Field welds shall be cleaned of flux and spatter and all damaged galvanizing removed, all hazardous projections ground off, properly prepared, and then heavily coated with self-curing inorganic zinc coating. Manufactured coatings shall be applied in strict accordance with manufacturer's printed specifications. Damage to existing painted surfaces shall be touched up.

B. Fence Posts, except as otherwise indicated or specified, shall be spaced not more than 10 feet apart. In curved fence sections having a radius of 50 feet or less, the posts shall be spaced as shown on the plans. Line posts shall be set so that top of the eye tops shall be at the same height as the fence fabric.

C. Top Rails shall pass through and bear firmly on base of eye tops, form a continuous brace from end to end of each stretch of fence, and be securely fastened to terminal posts with rail ends and brace bands. Couplings for the top rails shall be installed at intervals of 24 feet maximum.

D. Chain Link Fabric shall be fastened on the side of the posts as designated and shall be mounted on the posts so that the bottom of the fabric will be no more above the finished grade than called for on the plans. High points of the ground shall be excavated as necessary. The fabric shall be stretched taut and securely fastened to the posts. Ends of wire ties shall be bent back so as not to be a hazard. Between posts the top edge of the fabric shall be fastened to the top rail and the lower edge to the tension wire with tie wire of size and at spacing as called for on the plans. Tension wire shall be stretched tight and shall be installed in a straight line between posts. Tension bars extending the full height of the fence and

Reduce bottom clearance to 2" for tennis courts.

tension bar bands shall be used for fastening fabric to end, corner, pull and gate posts. Bolted tension bar bands shall be placed at top and bottom of tension bars and spaced at 12-inch intervals. Fastenings to line posts shall be made with tie wire of size and at spacing as called for on the plans.

E. Gates shall be of size specified in plans. The corners of gate frames shall be fastened together and reinforced with malleable iron fittings or by welding as approved. Welds shall all be ground smooth. Where sizes permit, frames shall be galvanized after fabrication, otherwise all welds shall be finished as specified for touching up abrasions and field welds. All drive gate frames for fences 4 feet and higher and walk gate frames for 6-foot high fences shall be cross- trussed with tension rods welded to frame at hooked end. Fabric specified for the fence shall be attached to the sides of the gate frame with full-height tension bars and tension bar bands at top, bottom and 12 inches ±o.c. along tension bars with 9-gauge tie wires shall be placed along the top and bottom of the gate at corners and 6 inches ±o.c. in between. The gates shall be hung by at least two hinges. For the drive gates, latches of the crop rod type shall be provided and shall be of the full gate height, arranged to engage the gate catch. For walk gates, a forked latch may be provided. Catch for the drop rod shall be galvanized pipe and set in concrete. Gate hold-backs shall be positioned to secure and support the free end of the gate in full open position and/or as shall be accessible from both sides of the gates.

3.02 FINAL CLEAN-UP

All exposed metal surfaces shall be clean and free of cement. All surplus earth resulting from metal fencing work that is not used in the grading work shall be cleaned up and disposed of off-site. All debris resulting from work of this section shall be removed from the site.

END OF SECTION